

Remarks

Claims 1, 3-12, and 14-17 remain in the application.

The Examiner has rejected claims 1, 4, 5, and 10 under 35 U.S.C. §103(a) as being obvious over Fai Lai (U.S. Patent 6,217,716) in view of Wegmann (U.S. Patent 4,622,121 or Scherer (U.S. Patent 5,728,280) or Okamura et al. (Japan 01-309964, hereafter Okamura). For the Examiner's convenience, a professional translation of the Okamura reference is submitted herewith. The restriction of claim 2 has been incorporated into claim 1 along with other restrictions so that this rejection is now moot.

The Examiner has rejected claims 1, 4, 5, 6, 10, and 12 under 35 U.S.C. §102(a) as being anticipated by Lai et al. (U.S. Patent 6,444,105, hereafter Lai '105) in view of Wegmann or Scherer or Okamura. Again, the restrictions of claim 2 have been incorporated into claim 1 so that this rejection of claims 1, 4, 5, 6, and 10 is now moot. Similarly, the restrictions of claim 13 have been incorporated into claim 12 so this rejection is also moot.

The Examiner has rejected 2, 3, and 8 under 35 U.S.C. §103(a) as being obvious over Fai Lai '716 in view of Wegmann or Scherer or Okamura and further in view of Gopalraja et al. (EP 1119017, hereafter Gopalraja). The restrictions of claim 2 as well as other restrictions have been incorporated into claim 1. The rejection is traversed. The Examiner relies upon the passage of Gopalraja at col. 18, lines 21-26 with reference to FIG. 13 for the alignment of the magnetic polarities of the outer pole of the roof magnetron and the sidewall magnets. However, Gopalraja's configuration is significantly different from that being claimed, specifically Gopalraja's annular vault versus the claimed cylindrical vault. Admittedly Gopalraja first discloses the magnetic polarity of the outer sidewall magnet 22 to be parallel to the polarity of the outer roof magnet 238, but he simultaneously teaches that the inner sidewall magnets 226, 228 to be anti-parallel to the outer roof magnet 238. This teaching is immediately followed by the admonishment that "these polarities may be varied." Gopalraja discloses no fundamental difference between his inner and outer sidewall magnets so that his only specific teaching is that

the two sidewall polarities be opposed. His figures emphasize the magnetic field closing within the small vault and little interaction is illustrated between the roof and sidewall magnets.

Gopalraja provides no guidance for choosing the polarities. The Examiner's statement that Gopalraja provides motivation for the particular configuration at col. 19, lines 20-22 as achieving a desired erosion pattern is not supported at the passage. The passage merely states that one may be tempted to try other configurations and the cited art even fails to disclose the desired erosion pattern. The obvious to try standard is not the standard for an obviousness rejection.

In fact, the references taken as a whole teach against the claimed configuration. Okamura's diametrical magnetic fields seem inapplicable to the claimed axial polarities. Sherer lacks a roof magnetron. Fai Lai shows that his roof magnets 126 of FIG. 10 are anti-parallel to the side wall magnets.129 and his outer magnetic pole of magnets 142 are similarly anti-parallel. Lai does not clearly describe the relationship of the polarities of his roof magnetron 6 and his side magnets 11. Wegmann states at col. 5, ll. 56, 32 the magnetic systems 29, 32 "are advantageously so polarized that they repel each other", that is, the neighboring poles are the same polarity. As a result, all the references teaching anything resembling a cylindrical target either do not disclose a roof magnetron, are silent on the relative polarities between roof magnetron and sidewall magnet, or disclose parallel rather than anti-parallel orientation. That is, the art of hollow cathode magnetrons teach that roof magnetrons if they are present have outer pole with polarities opposite that of the sidewall magnets, contrary to the claim configuration. No reasonable artisan would adopt Gopalraja's very weak and ill expressed counter teaching in a significantly different configuration of annularly vaulted targets to contradict the rather strong teachings for hollow cathode target of the other references.

Accordingly, taken as a whole the prior art including Gopalraja does not teach the magnetic polarities recited in claim 1.

The Examiner has rejected claims 2, 3, 8, 13, and 14 under 35 U.S.C. §103(a) as being obvious over Lai '105 in view of Wegmann or Scherer or Okamura and further in view of Gopalraja. These rejections are traversed. Lai'105 has been discussed above relative to Fai Lai '106. The restrictions of claim 13 have been incorporate into claim 12 and the arguments

presented for amended claim 2 apply equally thereto.

The Examiner has rejected claim 7 under 35 U.S.C. §103(a) as being obvious over Fai Lai or Lai '105 in view of Wegmann or Scherer or Okamura and further in view of Haag et al. (U.S. Patent 6,337,001), Glocker et al. (U.S. Patent 5,069,770, hereafter Glocker) and Kuman (U.S. Patent 5,178,743). This claim depends upon a claim believed to be in allowable form and should therefore also be allowable. Further, Haag does not show a partially closed cylindrical throat. Glocker's emission cell is not applicable to a sputter reactor including multiple magnet means. Kumar's roll sputtering chamber cannot be obviously combined with the other references using stationary substrates.

The Examiner has rejected claim 11 under 35 U.S.C. §103(a) as being obvious over Lai '716 in view of Wegmann or Scherer or Okamura and further in view of Gopalraja and yet further in view of Haag. This claim depends upon a claim believed to be in allowable form and should therefore also be allowable.

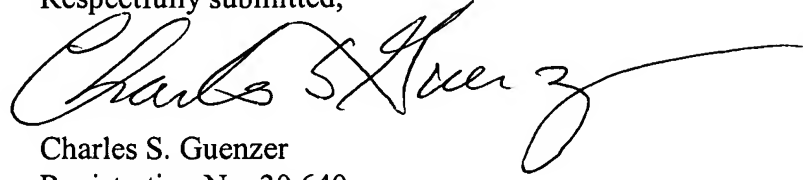
The Examiner has rejected claims 11 and 15-18 under 35 U.S.C. §103(a) as being obvious over Lai '105, in view of Wegmann or Scherer or Okamura and further in view of Gopalraja and yet further in view of Haag. Claims 11 and 14 depend upon claim believed to be in allowable form and should therefore also be allowable. The restrictions of claim 18 have been incorporated into claim 17. As a result, the arguments presented above for claim 1 should apply to claim 17 as well.

The Examiner has rejected claim 9 under 35 U.S.C. §103(a) as being obvious over Fai Lai '716 or Lai '105 in view of Wegmann or Scherer or Okamura and further in view of Gopalraja and yet further in view of Glocker. This claim depends upon a claim believed to be in allowable form. As stated above, the emission cell of Glocker is not obviously applicable to sputter reactors of the other references. No artisan in the field of standard sputter reactors would consult the emission cell of Glocker for the restricted emission throats. Such are standard for emission cell but not for sputter reactors of the sort of the other references.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

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